1 "Hello World!"

The simplest thing that does *something*

Python Java Ruby PHP C# JavaScript Go Elixir Objective-C Swift Spring AMQP

2 Work queues

Distributing tasks among workers (the competing consumers pattern)

Python Java Ruby PHP C# JavaScript Go Elixir Objective-C Swift Spring AMQP

3 Publish/Subscribe

Sending messages to many consumers at once

Python Java Ruby PHP C# JavaScript Go Elixir Objective-C Swift Spring AMQP

4 Routing

Receiving messages selectively

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5 Topics

Receiving messages based on a pattern (topics)

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6 RPC

Request/reply pattern example

Python Java Ruby PHP C# JavaScript Go Elixir Spring AMQP

Introduction

RabbitMQ is a message broker: it accepts and forwards messages. You can think about it as a post office: when you put the mail that you want posting in a post box, you can be sure that Mr. or Ms. Mailperson will eventually deliver the mail to your recipient. In this analogy, RabbitMQ is a post box, a post office and a postman.

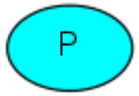
The major difference between RabbitMQ and the post office is that it doesn't deal with paper, instead it accepts, stores and forwards binary blobs of data – *messages*.

RabbitMQ, and messaging in general, uses some jargon.

Prerequisites

This tutorial assumes RabbitMQ is installed and running on `localhost` on standard port (`5672`). In case you use a different host, port or credentials, connections settings would require adjusting.

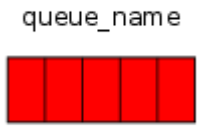
Producing means nothing more than sending. A program that sends messages is a *producer* :



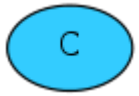
Where to get help

If you're having trouble going through this tutorial you can contact us through the mailing list.

A queue is the name for a post box which lives inside RabbitMQ. Although messages flow through RabbitMQ and your applications, they can only be stored inside a *queue*. A *queue* is only bound by the host's memory & disk limits, it's essentially a large message buffer. Many *producers* can send messages that go to one queue, and many *consumers* can try to receive data from one *queue*. This is how we represent a queue:



Consuming has a similar meaning to receiving. A *consumer* is a program that mostly waits to receive messages:



Note that the producer, consumer, and broker do not have to reside on the same host; indeed in most applications they don't. An application can be both a producer and consumer, too.

"Hello World"

(using the amqp.node client)

In this part of the tutorial we'll write two small programs in Javascript; a producer that sends a single message, and a consumer that receives messages and prints them out. We'll gloss over some of the detail in the amqp.node API, concentrating on this very

simple thing just to get started. It's a "Hello World" of messaging.

In the diagram below, "P" is our producer and "C" is our consumer. The box in the middle is a queue - a message buffer that RabbitMQ keeps on behalf of the consumer.

The amqp.node client library

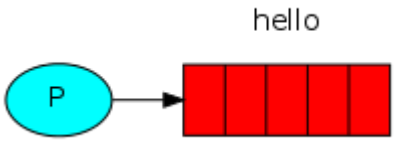
RabbitMQ speaks multiple protocols. This tutorial uses AMQP 0-9-1, which is an open, general-purpose protocol for messaging. There are a number of clients for RabbitMQ in many different languages. We'll use the amqp.node client in this tutorial.

First, install amqp.node using npm:

```
npm install amqplib
```

Now we have amqp.node installed, we can write some code.

Sending



We'll call our message publisher (sender) `send.js` and our message consumer (receiver) `receive.js`. The publisher will connect to RabbitMQ, send a single message, then exit.

In `send.js`, we need to require the library first:

```
#!/usr/bin/env node

var amqp = require('amqplib/callback_api');
```

then connect to RabbitMQ server

```
amqp.connect('amqp://localhost', function(err, conn) {});
```

Next we create a channel, which is where most of the API for getting things done resides:

```
amqp.connect('amqp://localhost', function(err, conn) {
  conn.createChannel(function(err, ch) {});
});
```

To send, we must declare a queue for us to send to; then we can publish a message to the queue:

```
amqp.connect('amqp://localhost', function(err, conn) {
  conn.createChannel(function(err, ch) {
    var q = 'hello';



    ch.assertQueue(q, {durable: false});
    // Note: on Node 6 Buffer.from(msg) should be used
```

```
    ch.sendToQueue(q, new Buffer('Hello World!'));
    console.log(" [x] Sent 'Hello World!'");
  });
});
```

Declaring a queue is idempotent - it will only be created if it doesn't exist already. The message content is a byte array, so you can encode whatever you like there.

Lastly, we close the connection and exit;

```
setTimeout(function() { conn.close(); process.exit(0) }, 500);
```

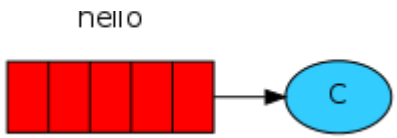
Here's the whole send.js script.

> **Sending doesn't work!**
>
> If this is your first time using RabbitMQ and you don't see the "Sent" message then you may be left scratching your head wondering what could be wrong. Maybe the broker was started without enough free disk space (by default it needs at least 200 MB free) and is therefore refusing to accept messages. Check the broker logfile to confirm and reduce the limit if necessary. The configuration file documentation will show you how to set `disk_free_limit`.

Receiving

That's it for our publisher. Our consumer is pushed messages from RabbitMQ, so unlike the publisher which publishes a single message, we'll keep it running to listen for messages and print them out.

hello



The code (in `receive.js`) has the same require as `send`:

```
#!/usr/bin/env node

var amqp = require('amqplib/callback_api');
```

Setting up is the same as the publisher; we open a connection and a channel, and declare the queue from which we're going to consume. Note this matches up with the queue that `sendToQueue` publishes to.

```
amqp.connect('amqp://localhost', function(err, conn) {
  conn.createChannel(function(err, ch) {
    var q = 'hello';

    ch.assertQueue(q, {durable: false});
  });
});
```

Note that we declare the queue here, as well. Because we might start the consumer before the publisher, we want to make sure the queue exists before we try to consume messages from it.

We're about to tell the server to deliver us the messages from the queue. Since it will push us messages asynchronously, we provide a callback that will be executed when RabbitMQ pushes messages to our consumer. This is what `Channel.consume` does.

```
```

```
console.log(" [*] Waiting for messages in %s. To exit press CTRL+C", q);
ch.consume(q, function(msg) {
  console.log(" [x] Received %s", msg.content.toString());
}, {noAck: true});
```

Here's the whole receive.js script.

Putting it all together

Now we can run both scripts. In a terminal, from the rabbitmq-tutorials/javascript-nodejs/src/ folder, run the publisher:

```
./send.js
```

then, run the consumer:

```
./receive.js
```

The consumer will print the message it gets from the publisher via RabbitMQ. The consumer will keep running, waiting for messages (Use Ctrl-C to stop it), so try running the publisher from another terminal.

Listing queues

You may wish to see what queues RabbitMQ has and how many messages are in them. You can do it (as a privileged user) using the `rabbitmqctl` tool:

```
sudo rabbitmqctl list_queues
```

On Windows, omit the sudo:

```
rabbitmqctl.bat list_queues
```

Time to move on to part 2 and build a simple *work queue*.

Production [Non-]Suitability Disclaimer

Please keep in mind that this and other tutorials are, well, tutorials. They demonstrate one new concept at a time and may intentionally oversimplify some things and leave out others. For example topics such as connection management, error handling, connection recovery, concurrency and metric collection are largely omitted for the sake of brevity. Such simplified code should not be considered production ready.

Please take a look at the rest of the documentation before going live with your app. We particularly recommend the following guides: Publisher Confirms and Consumer Acknowledgements, Production Checklist and Monitoring.

Getting Help and Providing Feedback

If you have questions about the contents of this tutorial or any other topic related to RabbitMQ, don't hesitate to ask them on the RabbitMQ mailing list.

Help Us Improve the Docs <3

If you'd like to contribute an improvement to the site, its source is available on GitHub. Simply fork the repository and submit a pull request. Thank you!

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